Dec. 24, 1963 L. E. KEATLEY 3,115,212

BONNET FOR WINDOW CLEANERS' LADDER

Filed May 9, 1962

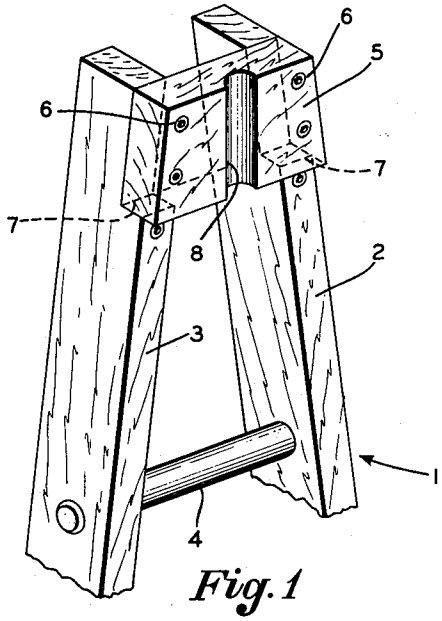


Fig. 1

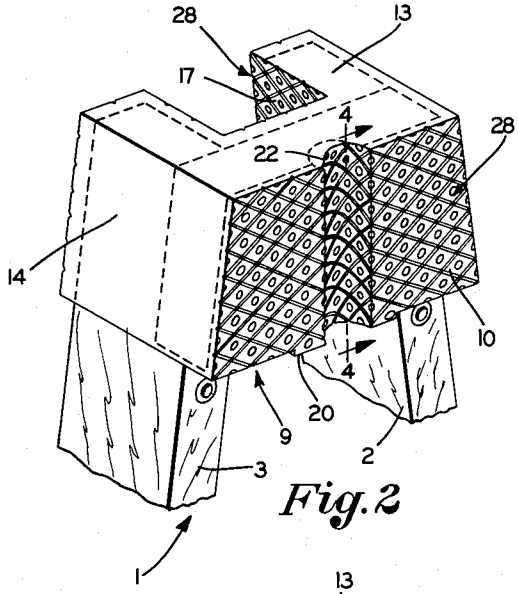


Fig. 2

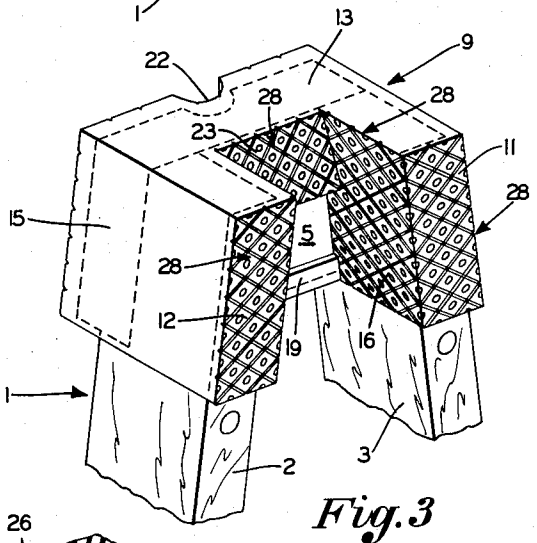


Fig. 3

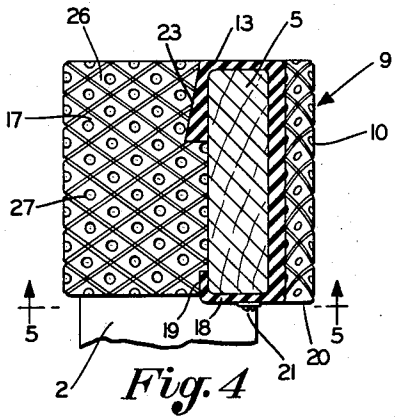


Fig. 4

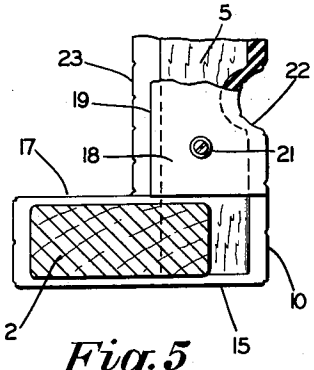


Fig. 5

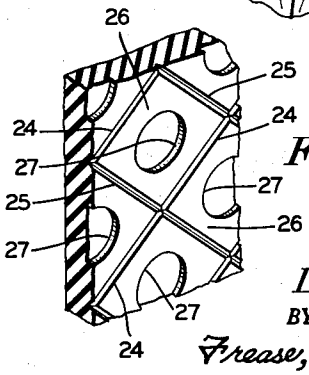


Fig. 6

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BONNET FOR WINDOW CLEANERS' LADDER

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1 Claim. (Cl. 182—108)

This invention relates to a ladder and more particularly it pertains to a bonnet for the upper end portion of a window cleaners' ladder.

Ladders used by window cleaners and persons having similar occupations are distinctive in that they are provided with hand rails which are not parallel and which converge at their upper ends. The spacing between the upper end portions of the rails is therefore smaller than the spacing at the lower end of the ladder. A conventional ladder for window cleaners is normally provided with a crosspiece or connector between the upper ends of the rails to permit placement of the upper end of the ladder against a very small area of a building such as a horizontal rail or vertical frame of a window.

Window cleaners normally prefer ladders made of wood instead of other material such as metal, primarily for safety reasons. A ladder composed of wood normally stays in place because sharp corners of a building such as brick will "bite" into the wooden ladder and thereby help to prevent the ladder from slipping out of place. As a result a window cleaners' ladder composed of wood normally has a short life. Frequent use in contact with hard sharp surfaces of a building causes excessive roughening and eventual splitting of the ladder.

The safety of a window cleaner is greatly dependent upon the maintenance of a ladder having the configuration of its original construction. The crosspiece at the upper end of the converging rails of such a ladder is adapted to be placed against and adhere to relatively small supports. If the crosspiece is permitted to become disintegrated over a period of frequent use, it will not serve its primary purpose of adhering to the position in which it is originally placed and as a result, the safety of the user is imperiled.

It has been found that the advantages of a ladder composed of wood may be maintained indefinitely and the foregoing disadvantages overcome by covering the entire upper end portion of a window cleaners' ladder with a bonnet. Such a covering may be provided not only for the purpose of protecting and maintaining the original shape of the upper end of the ladder but also for increasing the adherence of the ladder in the position in which it is placed. A covering for a ladder used by a window cleaner must include other properties such as resistance to abrasion and chemicals as well as non-marking of the surface of a building with which it comes in contact.

Accordingly, it is a general object of this invention to provide a bonnet for the upper end portion of a ladder for window cleaners to protect and increase the life of the ladder.

It is another object of this invention to provide a bonnet for the upper end portion of a ladder for window cleaners to protect the building against which the ladder is placed.

It is another object of this invention to provide a bonnet for a ladder for window cleaners having a skid-preventing surface which resists normal slipping forces incurred when a person is on a ladder.

It is another object of this invention to provide a bonnet which completely covers the upper end portion of the rails and crosspiece and adheres thereto in a snug-fitting manner.

These and other objects and advantages, apparent to those skilled in the art from the following description and claim, may be obtained, the stated results achieved, and the described difficulties overcome, by the apparatus, constructions, arrangements, combinations, subcombinations, elements, parts, and principles, which comprise the present invention, the nature of which is set forth in the foregoing general statements, a preferred embodiment of which—illustrative of the best mode in which applicant has contemplated applying the principles—is set forth in the following description and shown in the drawings, and which is particularly and distinctly pointed out and set forth in the appended claim forming part hereof.

Generally, the bonnet of the present invention may be stated as including a covering for the upper end portion of the rails and interconnecting crosspiece of a ladder of the type having converging hand rails and an interconnecting crosspiece at the upper end portions of the rails, the covering preferably including a front wall extending over the crosspiece vertical surface, back walls covering the upper end portions of the spaced rails, opposite side walls covering the outer sides of the rails, which side walls extend between and are connected to the front and back walls, means for securing said walls in place, and slip-resistant means on the front and back walls for preventing slipping of the ladder from the desired position against a support member.

Referring to the drawings, in which a preferred embodiment of the invention is shown by way of example:

FIGURE 1 is a perspective view of the upper end portion of the type of ladder normally used by window cleaners;

FIG. 2 is an enlarged perspective front view of the ladder having a bonnet mounted thereon;

FIG. 3 is a perspective view showing the rear view of the bonnet on the ladder;

FIG. 4 is a vertical sectional view taken on the line 4—4 of FIG. 2;

FIG. 5 is a bottom plan view taken on the line 5—5 of FIG. 4; and

FIG. 6 is an enlarged perspective view of a portion of the skid-resistant surface used on several walls of the bonnet.

Similar numerals refer to similar parts throughout the drawings.

In FIG. 1 the upper end portion of a window cleaners' ladder is generally indicated at **1**. It includes a pair of spaced substantially vertical hand rails **2** and **3**, a plurality of rungs such as a rung **4**, and a crosspiece or connector **5**. The conventional window cleaners' ladder includes side rails which converge at their upper end portions and terminate with a space substantially less than the spacing between the rails below the connector **5**. The connector **5** is secured to and extends between the rails **2** and **3** where it is secured in place by rivets **6** and in rectangularly shaped notches **7**.

Inasmuch as the primary purpose of the crosspiece or connector **5** is to provide a member by which the ladder **1** can be placed against a support member of relatively small area, such as the frame members of a window, the connector is preferably provided with a vertically extending groove **8**. The groove **8** has a preferably round surface in the outer or front wall of the connector **5**.

Although the front surface of the connector **5** is normally used or placed against a support member, the groove **8** permits the placement of the ladder against the corner of two surfaces of a building. There are other building configurations where it is safer to place the back side of the ladder against the building.

Suffice it to say, frequent use of the ladder **1** results in unusually rapid deterioration of the original shape of the upper end portions of the rails **2** and **3** as well as of the

connector 5. That is particularly true of the groove 8 which often becomes substantially useless.

The window cleaners' ladder 1 is preferably composed of wood because the wood yields to and is nicked by the harder surface of a building such as brick. Because the wooden ladder is thus less apt to slip out of place, the safety of the ladder is greater. Ladders composed of other materials such as metal have been found to be vary undesirable because they do not yield and are not readily nicked by the harder brick surfaces of buildings. On the other hand, frequent use of a wooden ladder eventually results in its permanent disfiguration and ultimately hastens its replacement.

As shown in FIG. 2, a bonnet is generally indicated at 9. It is a covering having a front wall 10, spaced rear walls 11 and 12 (FIG. 3), a top wall 13 and opposite side walls 14 and 15. In addition, inside side walls 16 and 17 are provided as shown in FIGS. 2 and 3.

The bonnet 9 is preferably a molded member composed of a tough resilient material such as leather, plastic, or rubber. The several walls 10–17 of the bonnet 9 provide an inner compartment having the exact configuration of the upper end portions of the rails 2 and 3 and the connector 5. The bonnet 9 fits snugly in place on said portions of the ladder, as shown in the drawings, and is provided with means including a flap 18 having an upturned flange 19 that extends from the lower edge of the front wall 10 at 20 across and under the connector 5. The flange 19 extends upwardly over a portion of the back wall of the connector 5 as shown in FIG. 4. If necessary, means such as one or more screws 21 may be provided for holding the flap 18 in place.

The front wall 10 of the bonnet 9 also includes a central groove 22 which fits snugly into the groove 8 of the crosspiece 5. As shown in FIG. 3, the bonnet 9 also includes a down-turned flange 23 which covers an upper portion of the back wall of the connector 5. The flange 23 has an upper edge and opposite ends joined by molding with the corresponding walls including the top wall 13 and the side walls 16 and 17. As shown in FIG. 4, flange 23 has an increasingly larger cross section extending from the upper to the lower end which permits greater contact with a support wall when the ladder is placed against such a wall.

As shown in the drawings, the various walls of the bonnet 9 are provided with slip-resist surface means to increase the friction between the bonnet and a building. Such surface means include a plurality of inclined grooves 24 disposed at preferably equally spaced intervals from each other. Similar grooves 25 are disposed at substantially right angles to the grooves 24. The grooves 24 and 25 provide parallelogram or diagonal surface portions 26 between each pair of spaced grooves 24 and 25. The edges of each surface portion 26 and the grooves 24 and 25, being inclined, provide a plurality of slip-resisting elements which greatly increase the slip resistance of the bonnet. The total effect of all of such edges acting upon a given surface operates to overcome the usual slipping forces that might otherwise occur without the grooves 24 and 25.

In addition, the slip-resistant surface means includes an aperture 27 in each surface portion 26, which increases the slip resistance between the ladder and a support member. Each aperture 27 may operate as a suction cup on a building surface against which the bonnet is placed and thereby increase the adherence of the bonnet to the surface.

As shown in the drawings, the slip-resistant surface means including the grooves 24 and 25, the surface portions 26, and the apertures 27 are provided on all surfaces of the bonnet which may be normally used. In FIG. 2, the slip-resistant surface means are generally indicated at 28 on the front wall 10 and side wall 17. In FIG. 3, the means 28 are provided on the rear walls 11 and 12, the flange 23, and the side wall 16. Accordingly, when those walls and/or flange are placed in contact or abutment with a ladder support member, the grooves 24 and 25 as well as the aperture 27 operates to prevent the ladder from slipping out of place.

The bonnet 9 is preferably composed of rubber having physico-chemical properties of French Philblack A type as follows:

ASTM iodine number	53
Nitrogen surface area, sq. m./gm	44
Oil absorption, cc. gm.	1.20
Photelometer (percent light transmission)	91
Ash, percent	0.14
Moisture, percent	0.3
Mass pellet strength, pounds	33
Density, lbs./cu. ft	23
Sieve residue, 325 mesh, percent	0.0040
Sieve residue, 30 mesh, percent	0.0000

A rubber composition having such properties is ideal for use as a bonnet because it is non-marking on such materials as aluminum siding and is resistant to abrasion and chemical action.

The device of the present invention provides a bonnet for the upper end of a ladder for window cleaners which bonnet serves the dual purpose of increasing the life of the ladder and protecting a support surface against which a ladder is placed. In addition, the device provides slip-resistant surface means on all walls which might be brought into contact with a support surface.

The bonnet is composed of a tough resistant material such as rubber having the slip-resistant surface means molded on the outer surfaces. The bonnet may, however, be applied by dipping the upper end of the ladder into liquid rubber with the slip-resistant surface provided as a solidified portion of the dipping process. Accordingly, a tight-fitting bonnet may be mounted on the upper ends of the ladder hand rails as well as the crosspiece, either by a separable bonnet or by a dipped rubber coating. Thus the rails and crosspiece are protected from the usual abrasion and deterioration resulting from normal contact and use of a ladder.

The device of the present invention also provides a bonnet for the upper end of metal ladders such as aluminum which without a slip-resistant bonnet are impractical. Inasmuch as the bonnet on a metal ladder provides greater frictional contact between the ladder and the support surface such as a building, a metal ladder having a bonnet is of greater practical service to the users of such ladders such as window cleaners.

In the foregoing description certain terms have been used for brevity, clearness and understanding, but no unnecessary limitations have been implied therefrom as such words are used for descriptive purposes and are intended to be broadly construed.

Moreover, the embodiment of the improved construction illustrated and described herein is by way of example and the scope of the present invention is not limited to the exact construction shown.

Having now described the invention, construction, operation and use of a preferred embodiment thereof and the advantageous, new and useful results obtained thereby; the new and useful bonnet for window cleaners' ladder and reasonable mechanical equivalents thereof obvious to those skilled in the art are set forth in the appended claim.

What is claimed is:

In a ladder of the type having two upright converging handrails, the upper end portions of which are spaced apart, and having an interconnecting crosspiece joined to the end portions and forming a U-shaped cross section therewith, the crosspiece upper edge surface aligned with the upper ends of the handrails, the crosspiece end surfaces being aligned with the side surfaces of the handrails, the crosspiece having one side surface abutting cor-

responding edges of the spaced handrails and having another side surface faced away from said one side surface and having an under edge surface extending between said two side surfaces; a safety bonnet for the ladder including

(*a*) a molded rubber-like bonnet having upper horizontal end and vertical side walls forming a chamber receptive of the handrail upper end portions and the crosspiece,

(*b*) the vertical side walls of the bonnet including a front wall extending over the vertical front surface of said crosspiece and including back walls extending over the upper vertical edge portions of said handrails and remote from said crosspiece,

(*c*) the bonnet also including spaced side walls coextensive with the aligned surfaces of said handrails and crosspiece and extending between the front wall and the corresponding back walls,

(*d*) the bonnet also including a pair of second side walls extending over the upper facing side surfaces of said handrails and extending from the back walls to the inner surface of said crosspiece,

(*e*) an undersurface flap foldable under the underside of the crosspiece,

(*f*) the undersurface flap having an upturned flange engageable with the back surface of the crosspiece; and

(*g*) slip-resistant means on the outer surfaces of said walls for preventing slipping of the ladder from the desired position against a support member and including crossing diagonally extending grooves in the outer surfaces of the bonnet walls and including a suction cup aperture in each diagonal portion formed by said diagonally extending grooves.

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